
Review

The Evolution of Hadith Studies: From Early Writing to Digital Verification in the Era of Modern Science

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ARTICLE INFO

Keywords: *Criticism of Hadith, Digital Hadith Verification, Hadith Writing, Modern Science*

Article History:

Received June 26, 2025

Accepted March 27, 2026

Published online April 3, 2026

ABSTRACT

The rapid expansion of digital access to information has transformed hadith studies, creating a critical challenge in the widespread dissemination of fabricated traditions and the limited availability of reliable digital verification systems. This study aims to examine the evolution of hadith verification from classical scholarship to contemporary digital approaches and to evaluate their effectiveness in preserving authenticity. A qualitative approach was employed through a literature review and historical comparative analysis to trace the development of hadith criticism, from traditional sanad and matan evaluation to emerging technologies such as artificial intelligence and blockchain. The findings indicate that although digital platforms enhance accessibility and accelerate dissemination, current verification tools remain insufficient for comprehensive and accurate authentication. Consequently, classical methodologies continue to serve an indispensable role in maintaining scholarly rigor. Besides, this study argues for an integrative framework combining traditional hadith criticism with advanced technological innovations to address current challenges. Hence, it concludes that such synergy provides a more reliable pathway for safeguarding hadith authenticity and offers a conceptual foundation for developing robust digital verification systems capable of mitigating contemporary disinformation.

1. INTRODUCTION

The contemporary digital era allows information to spread at an unprecedented speed, bringing both significant advantages and substantial risks. In the context of Islamic studies, this rapid dissemination increases the vulnerability of society to information distortion, including hoaxes and unverified religious texts (Mardjianto, 2022; Monggilo, 2022). As a primary source of Islamic law and guidance that clarifies the Qur'an (bayan al-tafsir), the hadith of the Prophet Muhammad SAW must be practiced with utmost care, necessitating rigorous authentication (Djamil, 2023; Khabir & Ridlo, 2025). Unfortunately, amidst the ease of accessing digital content, public awareness regarding the authenticity of the data received remains alarmingly low (Rosyad & Alif, 2023). Therefore, preserving the absolute truth of hadiths through strict filtration of digital content has become a vital necessity for Muslims today (H. A. Malik, 2017; Nawawi, 2020).

Historically, the effort to safeguard hadith authenticity has been a foundational pillar of Islamic scholarship, formalized since the second century when Caliph Umar bin Abdul Aziz ordered the official codification of hadiths. This classical tradition established a robust methodology based on sanad (chain of narrators) and matan (textual content) criticism. However, as the forgery of hadiths continues to evolve into the digital space, classical methods alone face practical limitations due to the sheer volume and velocity of online data. Although access to hadiths is now highly facilitated by (AI), natural language processing (NLP), and various digital applications, verification facilities that are genuinely accessible and accurate remain inadequate (Hamid, 2024). Thus, a balance must be maintained between the pure epistemological aspects of classical hadith sciences ('ulum al-hadith) and the applied aspects of modern technological tools.

The integration of technology into hadith studies has been a focal point of recent academic discourse. As a foundational effort, Hakak et al. (2022) evaluated digital authentication techniques using neural networks and classification-based methods, concluding that while these systems facilitate basic categorization, they remain inadequate for the comprehensive and nuanced authentication required by classical standards. Building upon this, Abdelaal & Youness (2019) explored the effectiveness of traditional Machine Learning algorithms, such as Naive Bayes and Decision Trees, to classify hadith reliability (Sahih, Hasan, Da'if, and Maudu') by extracting specific features from both the sanad and matan. The evolution of these computational tools reached a more advanced stage through the work of Gaanoun & Alsuhaibani (2022), who successfully implemented a Transformer-based Deep Learning model (BERT) to detect fabricated hadiths based on semantic patterns with an accuracy exceeding 92%. However, despite these significant algorithmic leaps, Majid, (2024) highlighted persistent practical challenges in the field, noting that current verification processes remain overly complex and time-d for the general public, thereby creating a need for more intuitive digital interfaces that bridge the gap between raw textual data and accessible user experience.

Based on these premises, this study formulates a specific research framework Darmalaksana (2020a) to address the absence of comprehensive digital verification tools. The primary objective of this research is to examine the evolution of hadith writing, assess the classical verification systems, and evaluate the current challenges and opportunities in integrating Islamic sciences with digital technology to find the most optimal verification steps. Ultimately, this study is expected to generate a profound impact on the academic discourse of Islamic studies, providing a strategic framework for scholars and technologists to collaborate in preserving the Islamic scholarly heritage against the modern disruption of digital disinformation.

2. METHOD

This study employed a qualitative research design with a library research design (Darmalaksana, 2020b). The research materials comprise primary and secondary literature sources. Primary sources include classical hadith compilations (e.g., Kutub al-Sittah) and authoritative digital hadith platforms such as Maktabah Syamilah. Secondary sources consist of peer-reviewed

journal articles, books, and proceedings related to hadith sciences and digital technology. Data collection was conducted by identifying and gathering relevant literature concerning hadith verification, digital hadith authentication, sanad and matan criticism, and the application of modern technology in hadith studies. The collected literature was then categorized based on the research themes (Darmalaksana, 2020c). Following data collection, the analysis was conducted through data reduction, data display, and conclusion drawing to synthesize the information into verifiable research facts (Rahmah & Darmalaksana, 2020). As a common method in religious studies, this literature review aims to gain an in-depth understanding of the phenomenon by synthesizing various relevant texts (Zed, 2014). The analytical procedure incorporated two specific approaches: historical analysis and comparative analysis. The historical analysis traced the chronological development of hadith studies from the Prophetic era to the contemporary digital age. Meanwhile, the comparative analysis evaluated classical sanad and matan verification methods against modern technological approaches, specifically (AI), big data analytics, and blockchain-based source authentication. This framework aligns with the descriptive qualitative method, providing a comprehensive and credible picture of technology's role in transforming hadith studies (Fauzi et al., 2022).

3. RESULTS AND DISCUSSIONS

To systematically analyze the evolution and current state of hadith verification, this study is anchored in an integrative theoretical framework that bridges the classical epistemology of 'Ulum al-Hadith, specifically the stringent principles of jarh wa ta'dil (narrator criticism) and sanad-matan evaluation with the contemporary paradigm of information systems and digital humanities. The traditional framework serves as the unyielding normative benchmark for defining hadith authenticity, ensuring that the foundational rigors established by classical scholars remain uncompromised. Concurrently, the digital systems framework provides an analytical lens to evaluate how modern computational tools, including AI and big data analytics, function as methodological extensions in accelerating takhrij (extraction) and classification. By utilizing this dual-lens approach, the ensuing sections methodically dissect the historical progression of hadith preservation and critically assess whether current digital interventions successfully operationalize or fall short of the classical epistemological standards.

3.1 Writing Hadith in the Classical and Digital Period

Hadith comprises the words, actions, and tacit approvals of the Prophet Muhammad SAW. During his prophethood, these teachings were received, preserved, and practiced by his companions (sahabah) with profound seriousness and meticulous care. The pre-Islamic and early Islamic Arab society was predominantly an oral culture, where literacy was relatively uncommon. Consequently, they possessed an extraordinary capacity for oral memorization and the accurate retention of spoken information. Therefore, during the early prophetic period, the companions were encouraged to memorize and disseminate the Prophet's hadiths to ensure his teachings

reached the broader Muslim community. Educational gatherings (majlis al-'ilm) served as primary platforms for reciting the Qur'an and engaging in dialogue with the companions. Furthermore, public lectures and sermons provided essential mediums for the Prophet to impart hadiths, establishing foundational guidance for the ethical practices and daily habits of Muslims (Luqman, Ningsih, & Nasution, 2023).

In the early stages of hadith development during the Prophet's lifetime, apparent contradictions emerged regarding the permissibility of writing down hadiths. One narration from Abu Sa'id al-Khudri explicitly prohibited the recording of anything other than the Qur'an.

لَا تَكْتُبُوا عَنِّي وَمَنْ كَتَبَ عَنِّي غَيْرَ الْقُرْآنِ فَلْيَمْحُهُ رَوَاهُ مُسْلِمٌ

"Do not write from me, whoever writes from me other than the Qur'an, erase it." (HR. Muslim).

Conversely, another hadith supports the documentation of the Prophet's words. The Prophet SAW pointed to his mouth and emphasized the importance of recording his statements.

اَكْتُبْ قَوْلَ الَّذِي نَفْسِي بِيَدِهِ مَا خَرَجَ مِنْهُ إِلَّا حَقٌّ رَوَاهُ أَبُو دَاوُدَ

"Write by the One whose soul is under His power, and nothing comes out of it except the right." (HR. Abu Dawud).

Scholars explain that the initial prohibition was a precautionary measure to prevent the hadiths from being mixed with the Qur'anic revelations. Once this fear subsided, the prohibition was lifted. Permission to write was granted specifically to companions who were literate and accurate, with these early records serving as personal notes rather than formal codifications (Anwar, 2020). Following the completion and regional distribution of the compiled Qur'an, literate Muslims seized the opportunity to document hadiths to safeguard them alongside oral memorization. After the Prophet's passing, the companions remained deeply committed to preserving his teachings, which profoundly influenced both the spiritual and social dimensions of Islamic life

Abdullah bin Mas'ud noted, "During the time of the Messenger of Allah, we did not write any hadith except regarding al-istikharah and tashahhud." This indicates that the formal writing of hadiths during the Prophet's lifetime was minimal compared to the documentation of the Qur'an (Irham, 2013).

Furthermore, during the Tabi'in era, hadith were widely studied and narrated from one person to another as an effort to preserve and continue the tradition that had existed since the time of the Prophet. The increasingly widespread territory of Islam had implications for the massive and significant increase in the spread of hadith. The method used by the Tabi'in in collecting hadith

was to meet teachers (whose status was a friend) and then record or memorize the hadith that would become their history from the direct meeting (liqa') (Andariati, 2020).

The large number of hadith that have been written and disseminated requires more focused attention so that there is a system that regulates the validity of hadith, considering how important hadith is for the good of Muslims. Codification or tadwin hadith is a form of effort regulated by the government (caliph) to collect and compile hadith in stages by involving a number of experts in this field. Systematically arranged knowledge can be more easily taught to the next generation, in line with the teachings of the Prophet Muhammad, who ordered his people to secure education so that Islamic insight is not lost or erased (Dainori, 2020).

In various literatures, it is stated that the process of codifying hadith officially began during the reign of 'Umar ibn 'Abd al-Aziz (99–101 H). To realize this effort, he issued instructions to governors in various regions to collect hadiths circulating in their areas. In particular, he also directed this order to the governor of Medina, Abu Bakr Muhammad ibn Hazm (d. 117 H), to collect the hadiths he had, including those from 'Amrah bint 'Abd al-Rahman al-Anshari, a student of Aisha.

Ibn Abdul Bar al-Qurtubi revealed in his book, *Jami' Bayan al-'Ilmi wa Fazlihi*, that al-Zuhri was the first person to pioneer the effort to write down the Prophet's hadith, in line with Ibn Hajar's explanation in his book entitled *Fathul Bari* (Irham, 2013). His full name is Muhammad ibn Muslim ibn Syihab al-Zuhri. He summarized 70 hadiths that he received from the Prophet, then wrote them down and distributed them to the regions independently without the help of others. Scholars from Mecca, Medina, Basrah, Kufa, Syria, Yemen, Khurasan, Egypt, and Wasith made similar contributions in the following period. The texts of the hadiths were written, grouped into various chapters, then compiled into one book known as *Mushanna'af* or *Jami'*. This process became part of the codification of the hadith at that time. One of the books from this era that can still be traced to contemporary times is *al-Muwatha'* by Imam Malik (Sholeh, 2020). However, books like this have a weakness, namely the mixing of the Prophet's hadith with the fatwas of the companions and tabi'in.

At the end of the second century AH, Abu Daud Al-Thayalisi composed the musnad books as a result of systematic efforts to separate the Prophet's hadith from the fatwas of the companions and tabi'in. This was followed by other scholars, including Ahmad bin Hanbal, whose work is still phenomenal today. The development of hadith science also reached the period of selecting authentic, hasan, and da'if hadith using the rules of authenticity in terms of both sanad and matan. The two most dominant scholars in this categorization initiative were Imam Bukhari and Imam Muslim, accompanied by ashab al-sunnan, including al-Tirmidhi, Abu Daud, al-Nasa'i, and Ibn Majah. They succeeded in compiling books that had a high level of authenticity. Although there are still variations in the grouping, *Kutubus Sittah*, which is later known as the six authoritative mother books of hadith and has become a reference throughout the ages, was written by the six scholars (Muslehuddin, Nurmaidah, & Zahraini, 2021). Imam Bukhari stated: "*I do not include in this Jami'-ku book except that it is authentic*" (Nawawi, 2020). This book contains 7,397 hadiths.

After completing its compilation, al-Bukhari showed the work to Ahmad bin Hanbal, Ibn Ma'in, Ibn al-Madani, and hadith scholars. It turned out that they concluded that the quality of the hadiths in this book could not be doubted; only four hadiths needed to be reviewed. Ibn Salah stated that the authentic hadiths in *Sahih al-Bukhari* numbered 7,275 hadiths with repetition and without repetition; there were 4000 hadiths (Muhibbin, 2004). Meanwhile, in *Sahih Muslim* without repetition, there are around 4,000 hadiths (Wahid, 2018).

Imam Bukhari did not explicitly explain the method of selecting hadiths in compiling his book. However, hadith experts concluded that there were two main requirements applied in the selection process.

1. Imam Bukhari only included hadiths with the best quality, namely hadiths whose narrators did not receive negative criticism from hadith experts, especially in terms of faith. This is different from Imam Muslim, who also included hadiths with narrators whose status was still disputed. This is the reason why *Sahih Bukhari* is considered superior to *Sahih Muslim*.
2. Imam Bukhari emphasized the importance of a direct connection between students and teachers, at least by having a meeting, even if only once. Therefore, he did not include *mu'an'an* hadiths (hadiths with unknown narrators) unless it was strongly proven that the narrator actually heard the hadith from his teacher. On the other hand, Imam Muslim did not set conditions as strict as those imposed by Imam Bukhari.

Meanwhile, the *Sahih Muslim* book has several advantages, including: (a) The compilation of its contents is done systematically and orderly, (b) The selection of hadith editorials (matan) is done carefully and precisely, (c) The structure of the sanad is arranged well and organized, and (d) The hadith is grouped according to a certain theme so as to minimize repetition.

The characteristics of this book are in accordance with the specifications of *mu'an'an*, namely the direct narration model between the recipient and the source of the hadith. *Sahih Muslim* compiled around 7,275 hadiths, of which 2,326 have the same meaning as the hadiths in *al-Jami' al-Bukhari*. However, scholars have criticized that this book contains 16 *marfu' mu'allaq* hadiths and 132 hadiths that are suspected of being *syadz* hadiths.

According to M. Fu'ad 'Abd al-Baqi, the *Sahih Muslim* book contains around 3,033 hadiths. The calculation is done based on the subject, not through the isnad system as is commonly used by the *muhadditsin*. If the isnad-based method is applied, the number of hadiths in this book could possibly increase twofold (Azami, 2003).

Imam Muslim, through his *Sahih* book, is recognized by hadith scholars as the figure who occupies the second position after Imam Bukhari in compiling authentic hadiths. The criteria for the validity of a hadith according to Imam Muslim include: (1) The hadith must have a chain that continues from the *mukharrij* to the companions, (2) The narrators must be trustworthy at every level of the sanad, and (3) The narrators must come from the same era as the *sheikh al-hadith*, even though there is no evidence of a direct meeting between them (Ma'arif, 2012).

The following century became a golden age in the development of hadith science, especially in the codification and methodology of hadith criticism, when many scholars who codified hadiths

made observations and explanations, compiled summaries, *tahdzib*, and various other processes. *Ulama* who lived in this period were also called *ulama muta'akhirin* (Muslehuddin et al., 2021).

The era of scientific digitalization began in the late 20th century, precisely in 1997, when the use of the internet began to spread throughout the world. The birth of scientific digitalization has had a positive impact on the development of hadith studies, both in the form of explanations and the quality of the authenticity of the hadith. Several applications actually make hadith takhrij their main branding, for example, *Jawami'ul Kalim*, *Mausu'ah al-Hadith al-Sharif al-Nabawiy*, *al-Durar al-Saniyah*, and others.

The transformation of science towards the digital age makes all knowledge easily accessible, and the digital generation responds very well to this. One of them is by making hadith studies easier to access in a relatively short time, without being limited by space and time (Zulkipli et al., 2017). The forms of hadith digitalization in the current era vary; some are in the form of the web, Java-based applications, PC-based applications, and Android-based applications. In addition, hadith studies can also be enjoyed by the public through television channels (Nikmah, 2022).

In addition to the above forms, the spread of hadith is also rampant on social media platforms that have a very high level of interactivity, accessibility, and speed, which influences the meaning and religious knowledge. The phenomenon of the spread of hadith on social media has undergone a significant transformation along with the development of digital technology. Several studies show that several digital platforms have become the main means of spreading hadith in the digital era. Instagram dominates as a platform that allows the presentation of hadith in feed, stories, and reels formats. This platform makes it easy for users to access and share hadith content in a way that is easier to digest, although sometimes it has to sacrifice the depth of analysis (Istianah, 2020). Other platforms such as Facebook and Twitter also play an important role in the spread of hadith, but challenges arise related to the accuracy of the information disseminated. The circulation of fake hadith on social media has become a critical issue that requires in-depth study, considering that digital platforms can quickly spread unverified information (Setiawan, 2024). YouTube has emerged as the second most influential platform, especially in presenting hadith in more depth and comprehensively. The longer video format allows for detailed discussion of various aspects of the hadith, although it is often not accompanied by adequate sanad analysis (Rizaldi, 2023). TikTok, as a relatively new social media platform, has shown significant influence in the spread of hadith, especially among the younger generation. The characteristics of short content are often packaged in a concise form (Apriliah, Supriyanto, & Almunadi, 2023).

In responding to this development, the urgency of studying hadith reception has become increasingly relevant in identifying patterns of distribution and understanding of hadith, as well as formulating effective hadith literacy strategies. Scholars also use hermeneutic methods to evoke the meaning contained in the text, considering the historical-social context, and the place where the hadith was delivered (Farihin & Khasani, 2023). To ensure the responsible use of technology in hadith research, there are a number of ethical principles that need to be considered. One of them is maintaining the honor and blessing of the hadith itself in every process of digitization and

analysis. In the era of increasingly widespread information, verifying the reliability of websites, digital platforms, and various other sources is a crucial aspect in collecting and studying hadith.

The use of technology must also consider the risk of spreading inaccurate or manipulative information, which can threaten the integrity of hadith research and education. In addition, in the process of digitizing hadith, both for archiving and distribution via social media, there needs to be protection of privacy and confidentiality of data relating to individuals and communities (Fachrurrosi & Arifin, 2024).

Beyond these ethical and privacy considerations, the rapid dissemination capabilities of modern technology have unfortunately been exploited by irresponsible actors to spread fabricated hadiths across digital platforms (Fitriani, 2017). The motives range from manipulating public opinion and causing sectarian divisions to altering textual wording for personal gain or social media popularity. The impact of these fabricated hadiths is profoundly detrimental, leading to theological doubts, distorted religious comprehension, and communal discord. To effectively avoid and mitigate the spread of false hadiths, previous research emphasizes the necessity of a multi-faceted approach. Empirical studies suggest that implementing automated, AI-driven fact-checking algorithms specifically trained on classical hadith corpora can significantly reduce the circulation of unverified texts. Furthermore, enhancing digital literacy among the Muslim populace, fostering active collaboration between religious authorities and social media platforms to flag and remove fabricated content, and enforcing stricter digital regulations are proven strategies to safeguard the integrity of Islamic teachings online (Ghifari, 2023).

3.2 Hadith Verification System

The process of codification of hadith that began in the second century of Hijri has not yet reached perfection, because it contains a mixture of authentic, hasan, and weak hadith. Therefore, serious attention is needed to ensure that the purity of the Prophet's teachings is maintained. Entering the 3rd century of Hijri, the period of purification, health, and perfection of hadith (*al-tajrid wa al-tashhih wa al-tanqih*) began, which lasted from the end of the reign of the first generation of the Abbasids, namely Caliph al-Makmun, to the beginning of the reign of the second generation under Caliph al-Muqtadir (Isma'il, 1992).

During this period, scholars began to classify hadith based on several levels, with different rules for each category. One of the figures who pioneered this systematics was Ishaq Ibn Rahawaih, Imam Bukhari's teacher, who was then continued by al-Bukhari, Muslim, Abu Dawud, al-Tirmidhi, al-Nasa'i, Ibn Majah, and others (M. Malik & Islamiyah, 2023). Before the emergence of al-Tirmidhi, the classification of hadith was limited only to authentic and *dha'if*. Subsequently, this system developed with the addition of the Hasan hadith category.

This hadith selection process also produces standards for narrators, which cover various aspects such as fairness, geographical background, place of residence, and period of their life. From this development, the science of *dirayah* hadith also emerged, which complemented the previously existing knowledge of *riwayah* hadith (Fathurrahman, 1985).

In the Book of *al-Madkhal*, al-Hakim explains that the highest level of authentic hadith chosen by al-Bukhari and Muslim is hadith that have a continuous *sanad*, with narrators who meet the following criteria (Syukrillah, 2018).

1. The friend who narrated the hadith was not *majhul*, because it was narrated by two fair *tabi'in*.
2. Translators from the *tabi'in* generation are known as trusted hadith transmitters and have at least two *thiqah* students.
3. Narrators from the *atba' at-tabi'in* generation have a strong level of memorization and accuracy in narration, and have students from the next generation.
4. The teachers (*shuyukh*) of al-Bukhari and Muslim was a *hafizh* narrator and was famous for the characteristic of 'is' in his narration.

Syuhudi Ismail emphasized the importance of researching the *sanad* and *matan* of hadith in the process of verifying the status of hadith (Isma'il, 1988). In his study, he divided the criticism of the *matan* of hadith and the commentary on hadith into two main categories, namely major rules and minor rules. Major rules include five fundamental aspects: (1) the *sanad* must be continuous, which ensures the continuity of the chain of transmission without any breaks; (2) the narrator of the hadith must be fair, namely having maintained moral and religious integrity; (3) the narrator must also be *dhabit*, namely having the ability to memorize and convey the hadith with high accuracy; (4) the hadith must not contain irregularities (*syudzudz*), namely deviations from the majority of stronger narrators; and (5) there are no hidden defects (*'illat*), namely errors in the hadith that can affect its validity. Of these five principles, the first three focus on the *sanad* aspect, while the other two are related to both the *sanad* and *matan*.

In addition, minor rules provide further details on the major principles. The first element, namely continuous *sanad*, contains several minor criteria such as the hadith must be *muffashil* (have clear *sanad* details), *marfu'* (directly based on the Prophet SAW), *mahfuzh* (preserved from changes or errors), and not *mu'allal* (free from hidden defects). The second element, namely the justice of the narrator, has additional aspects: the narrator must be Muslim, have *mukallaf* (baligh and sane), carry out the provisions of Islam, and maintain *mur'ah* (honor that can be trusted). The third element, the *dhabit* nature of the narrator, also contains minor requirements such as having to memorize the hadith well, be able to convey the narration clearly to others, and be free from *syudzudz* and *'illat*, so that the hadith he narrates remains authentic and reliable. With this system of major and minor rules, hadith research becomes more structured, ensuring that the received hadith are truly valid and in accordance with scientific standards that have been developed by scholars.

The verification system that has been formed and developed over time cannot be eliminated or changed even in this digital era. To minimize misinterpretation of hadith in this fast-paced era, Muslims still need to prioritize these rules and should not consume the circulating hadith quotes raw. Unfortunately, the long and time-consuming verification process makes many Muslims, especially lay people, difficult and overwhelmed. In addition, access to verification sources cannot

be searched instantly (Majid et al., 2024). Therefore, as a solution, a more adaptive approach is needed without sacrificing scientific accuracy. Digitization can be a tool that accelerates access to valid sources, but it must still follow the verification rules that have been inherited by hadith scholars (Akbar et al., 2024). Some solutions that can be applied in facing this challenge include:

First, the Integration of (AI) and Machine Learning in Takhrij and Authenticity Classification. Recent empirical studies demonstrate that various AI architectures are actively utilized for hadith verification. Traditional Machine Learning (ML) algorithms, such as Naive Bayes and Decision Trees, are implemented to classify hadiths into categories (Sahih, Hasan, Da'if, Maudu') by extracting features from the sanad (chain of narrators) and matan using methods like TF-IDF (Abdelaal & Youness, 2019). Furthermore, advanced Deep Learning (DL) and Transformer-based NLP models, such as AraBERT and mBERT, are now implemented to analyze the contextual semantics of hadith texts. For instance, Gaanoun & Alsuhaibani (2022) successfully implemented a BERT-based model specifically to detect fabricated (maudu') hadiths based purely on matn patterns. The empirical advantages of these AI systems include high-speed processing and exceptional accuracy, with ML models reaching up to 93.75% classification accuracy and BERT models achieving over 92% accuracy in detecting fabrications (Abdelaal & Youness, 2019; Gaanoun & Alsuhaibani, 2022). However, researchers note significant disadvantages: AI models still struggle with nuances in overlapping categories (e.g., distinguishing between weak and good hadiths based purely on text), they operate as "black boxes" lacking epistemological transparency, and there is a lack of standardization in how AI interprets the strict rules of 'Ulum al-Hadith compared to human scholars (Hakak et al., 2022).

Second, Digitalization and Integrated Takhrij Systems. Applications and websites such as Maktabah Syamilah or Lidwa Pusaka need to be strengthened with more intuitive, AI-driven search features. Thus, Muslims can search for hadiths based on keywords, narrators, or reference books without having to go through an overly complicated process, bridging the gap between raw textual data and accessible user interfaces.

Third, Digital Counseling and Literacy in Hadith Studies. Education on hadith criticism methods needs to be provided widely, either through online seminars, educational content, or interactive courses. As technological advancements and online platforms make the fabrication and alteration of hadiths highly feasible (Hakak et al., 2022), a better understanding of the traditional science of jarh wa ta'dil ensures that people can critically evaluate digital outputs and be wiser in accepting and disseminating hadiths.

Fourth, Collaboration between Ulama and Academics in the Digital Era. There needs to be a scientific forum or network that connects traditional hadith scholars (muhaddithin) with data scientists and technology experts. This ensures that the algorithmic parameters used in AI models remain in strict accordance with the epistemological principles of Islamic science. This approach not only maintains theological accuracy but also increases efficiency in the dissemination of authentic hadith knowledge.

With this solution, Muslims can more easily access valid hadith without having to sacrifice the principles of verification that have been tested over time. A technological approach that adheres to classical methodology will ensure that digitization becomes a tool, not a substitute, in understanding the teachings of the Prophet Muhammad SAW.

3.3 Challenges in Verifying Hadith in the Digital Era

As Muslims, digitalization is not just a challenge of adaptation, but also a great opportunity in the development of science and technology. Its benefits have been felt in various aspects of life, such as fast communication, wide access to information, digital-based education, as well as medical advances and data storage systems. The role of Muslim scientists in history shows the importance of active involvement in the development of technology to remain in line with Islamic values.

More than just utilization, Muslims have an urgency to master the science that gives birth to technology. This is in line with the words of the Prophet Muhammad SAW. in the hadith narrated by Muslim No. 3084, which states that a person's deeds will be cut off after his death, except for three things: ongoing charity, beneficial knowledge, and the prayers of pious children. By understanding and developing , big data, and other innovations, Muslims can contribute to global progress while ensuring that technology is developed with Islamic ethics and morals in mind. Thus, a technically advanced civilization remains based on the principles of justice, usefulness, and spiritual values.

In the *Encyclopedia of Hadith Book of the 9 Imams*, the search for hadith is done using the keyword "beneficial knowledge", then several hadiths appear, one of which is the hadith narrated by Muslim no. 3084. This hadith is *Sahih* with the editorial reading:

حَدَّثَنَا يَحْيَى بْنُ أَيُّوبَ وَقُتَيْبَةُ يَعْنِي ابْنَ سَعِيدٍ وَابْنُ حُجْرٍ قَالُوا حَدَّثَنَا إِسْمَاعِيلُ هُوَ ابْنُ جَعْفَرٍ عَنِ الْعَلَاءِ عَنِ أَبِيهِ عَنِ أَبِي هُرَيْرَةَ أَنَّ رَسُولَ اللَّهِ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ قَالَ إِذَا مَاتَ الْإِنْسَانُ انْقَطَعَ عَنْهُ عَمَلُهُ إِلَّا مِنْ ثَلَاثَةٍ إِلَّا مِنْ صَدَقَةٍ جَارِيَةٍ أَوْ عِلْمٍ يُنْتَفَعُ بِهِ أَوْ وَلَدٍ صَالِحٍ يَدْعُو لَهُ رَوَاهُ أَبُو دَاوُدَ

"Yahya bin Ayyub, Qutaibah bin Sa'id, and Ibn Hujr have told us, they said: Isma'il bin Ja'far, from al-'Ala', from his father, from Abu Hurairah, has told us that the Messenger of Allah said: "When a person dies, then all his deeds come to an end except for three things, namely: continuous charity, beneficial knowledge, and a pious child who always prays for him." (HR. Abu Dawud).

The hadith above explains that all the good deeds of a person will definitely stop after his death, apart from three things: ongoing charity, beneficial knowledge, and the prayers of a pious child for his parents. In the context of technology, useful knowledge includes the development and utilization of technology that brings benefits to humanity. Islam strongly emphasizes the importance of knowledge, such as the meaning found in the words of the Prophet Muhammad

SAW. with another translated excerpt, "Seeking knowledge is an obligation for every Muslim." (HR. Ibn Majah no. 220). Knowledge is not necessarily confined to religious aspects, but also includes worldly knowledge that can improve welfare and the progress of civilization.

In Islamic history, Muslim scholars such as Al-Khwarizmi in mathematics, Ibn Sina in medicine, and Al-Farabi in philosophy have shown that science and technology can develop in line with Islamic values. The Islamic view of technology emphasizes that its use must bring benefits and not conflict with moral and ethical principles. In fact, in some *fiqh* perspectives, the development of technology that provides broad benefits can be categorized as *fard kifayah*, which means a collective obligation for Muslims (Suprpto & Yulianto, 2023). Thus, Muslims have a responsibility not only to utilize technology but also to contribute to its development so that it remains in accordance with Islamic values and provides benefits for human life.

In the digital context, hadith verification faces different challenges compared to conventional methods that are manual-based and involve direct tracing of *sanad* and *matan* (Hasanah & Hifni, 2024). Moreover, *sanad* functions as a tool to prevent someone from lying or propagating false hadith (Dozan, Turmuzi, & Sugitanata, 2020). In the archipelago, information about hadith often spreads very quickly with social media as the medium that has superiority in this regard, followed by websites and messaging applications. Unfortunately, much of this information does not go through a strict verification process, leading to the spread of fake or inauthentic hadith.

One of the main challenges in digitizing hadith is maintaining the authenticity and accuracy of the documentation. Errors in transcription or formatting can change the meaning of the hadith, so a system is needed to ensure that the uploaded text remains in accordance with the original source. In addition, programmatic bias in the algorithms used for hadith analysis is also a concern. Inaccurate algorithms can produce inaccurate or even misleading information, both in the selection of sources and in the interpretation of the text (Nainggolan, 2024).

In addition, ethical challenges in interpreting hadith in the digital era need serious attention. Hadiths that are spread online are often taken out of context, which can lead to misunderstandings or even manipulation of meaning. Therefore, a mechanism is needed to ensure that the quoted hadith remain in accordance with the correct understanding in the science of hadith. To ensure the accuracy and reliability of digital content, sharia control involving hadith experts and scholars is needed. Without adequate supervision, the digitization of hadith risks producing information that is invalid or contrary to Islamic principles.

In addition, cultural and social influences also play an important role in the spread of hadith online (Abdulrahman, 2024). Hadith quoted in one culture may be understood differently in another culture, especially if there is insufficient explanation of the historical context and Islamic law surrounding it. This difference in understanding can lead to the distortion of the meaning of hadith and affect the way people use it in their daily lives.

Conventional verification, which focuses on researching hadith sources through literature references and in-depth research into the credibility of narrators, faces difficulties in the digital era due to the high volume of information that must be checked (Umanah, 2024). In addition, the speed

of information dissemination on digital platforms often reduces the time available to verify the authenticity of a hadith. In the digital context, there needs to be technology that can assist in verification, such as software or algorithms that can assess the validity of sources and check the consistency of hadith with authoritative literature.

To address these challenges, current research highlights several evidential data and technical methodologies for digital authentication. Recent empirical studies demonstrate that various AI architectures, such as Naive Bayes and Decision Trees, are now actively utilized to classify hadiths into categories like Sahih, Hasan, and Dha'if by extracting features from both the sanad and matan (Abdelaal & Youness, 2019). Furthermore, advanced Deep Learning and Transformer-based models, such as AraBERT, have shown exceptional accuracy in detecting fabricated (maudu') hadiths based purely on semantic patterns. For instance, (Gaanoun & Alsuhaibani, 2022) successfully implemented a BERT-based model that achieved over 92% accuracy in identifying fabrications. These digital tools, when combined with digitized biographical dictionaries (Kutub al-Rijal), allow for a rapid cross-referencing of narrator credibility, effectively bridging the gap between classical scholarly rigor and modern computational efficiency.

3.4 The Most Optimal Verification Method to Date

In the rapidly developing digital era, Muslims are faced with new challenges in understanding and verifying hadith (Ahmadi, 2025). Although technology has made it easier to access Islamic sources, conventional verification methods still have an important role in ensuring the validity of a hadith. Ulumul Hadith, as a discipline that focuses on the criticism of *sanad* and *matan*, is crucial in filtering Islamic information circulating in digital media (Ridha, 2025).

Critical digital literacy is an aspect that is prioritized over simply relying on a digital verification system. A study shows that the digitization of hadith, such as through the *Maktabah Syamilah* and *Lidwa Pusaka* applications, does facilitate access, but still requires an in-depth understanding so that there are no errors in interpretation (Ummah, 2019). Therefore, Muslims need to develop critical thinking skills in evaluating digital information, as emphasized in academic literature on the challenges of Islamic education in the digital era. With a balanced approach between technology and traditional methods, Muslims can ensure that the understanding of hadith remains authentic and is not distorted by less valid information. Although digitalization is developing rapidly and providing easy access, Muslims should not abandon conventional verification methods and rely solely on digital sources or instant in understanding hadith. The science of hadith as a profound discipline remains the main foundation in ensuring the authenticity and validity of hadith. Therefore, critical digital literacy is much more important than simply relying on digital verification systems, especially when direct access to printed books, e-books, or applications is not yet possible. Thus, the understanding of hadith can remain authentic and avoid misinterpretations that may arise in this digital era.

4. CONCLUSION

This study concludes that the evolution of hadith scholarship, from early oral transmission and manual codification to contemporary digital verification, reflects a sustained commitment to preserving the authenticity of prophetic traditions amid changing epistemic challenges. The findings demonstrate that modern technologies, including NLP and digital databases, enhance the efficiency of takhrij and broaden access to hadith sources; however, it remains insufficient to substitute the methodological depth of classical sanad and matan criticism. In response to the increasing circulation of fabricated hadiths in digital environments, this study identifies a hybrid verification model as the most effective approach, integrating computational capabilities with the foundational principles of jarh wa ta'dil. The primary contribution lies in proposing a theoretical framework that bridges classical 'ulum al-hadith and contemporary data science. This integrative perspective offers a strategic foundation for strengthening verification practices while preserving scholarly rigor. Ultimately, the study advocates a critical yet adaptive engagement with technological advancements, ensuring that innovation supports rather than compromises the integrity of Islamic intellectual heritage in the context of ongoing digital disinformation..

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